Space Weather Forecast

Issued on Thursday 31 October 2024 at 12:39 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated Moderate flares expected, with a chance of Strong flares. S1 Minor Solar Radiation Storm easing.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with the peak Moderate flare (R2 Radio Blackout) from the western most region in the northeast. This currently has a complex magnetic structure and some growth of intermediate regions, suggesting an ongoing flare risk. This is one of thirteen regions currently on the Earth-facing disc, however the other regions have remained largely inactive, limited to only Common-class flaring with either a stabilising or declining trend. The other main flare risk is the southernmost region in the southwest disc, as this has seen its trailer and leader spots, approach each other and potentially increase instability and the flare potential across the region.

No Earth-directed CMEs (coronal mass ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Ongoing fast winds were observed, likely associated with a coronal hole that is now impossible to see as it rotates around the west limb. Solar wind speeds were slightly elevated to elevated, but also highly variable, between 480-550 km/s. Interplanetary Magnetic Field (IMF) was weak with the north-south component varying weakly between northward and southward orientations. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at S1 Minor Radiation Storm levels throughout, but with an easing trend.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected to continue through the period, with isolated Moderate flares expected and a chance of an isolated Strong flare.

Solar Wind / Geomagnetic Activity: There are no CME arrivals currently expected, however this may change at short notice. Current fast winds expected to slowly ease through days 1-2 (31 Oct-01 Nov). A large coronal hole just west of centre disc may cause further enhancement back to elevated levels through the latter part of day 3 (02 Nov). Mainly Quiet geomagnetic activity is expected, with a isolated Unsettled intervals. There is a slight chance of Active to G1 Minor Storms later on Day 3 (02 Nov), should connection to the aforementioned coronal hole occur, with perhaps a greater likelihood of connection by day 4 (03 Nov).

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is expected to continue easing, likely falling below the S1 Minor Radiation Storm level either late day 1 (31 Oct) or through day 2 (01 Nov). However, any further notable flares will bring the potential for further enhancement.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	80	80	80
Very Active	R3-R5 (X Class)	No	25	25	25	25

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	99	60	20	20
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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